Connecting via Winsock to STN

Welcome to STN International! Enter x:x

LOGINID:ssptaeal1624

PASSWORD:
TERMINAL (ENTER 1, 2, 3, OR ?):2

* * * * * * * * * * Welcome to STN International * * * * * * * * * *

NEWS	1		Web Page for STN Seminar Schedule - N. America
NEWS	2	DEC 01	ChemPort single article sales feature unavailable
NEWS	3	APR 03	CAS coverage of exemplified prophetic substances enhanced
NEWS	4	APR 07	STN is raising the limits on saved answers
NEWS	5	APR 24	CA/CAplus now has more comprehensive patent assignee information
NEWS	6	APR 26	USPATFULL and USPAT2 enhanced with patent assignment/reassignment information
NEWS	7	APR 28	CAS patent authority coverage expanded
NEWS	8	APR 28	ENCOMPLIT/ENCOMPLIT2 search fields enhanced
NEWS	9	APR 28	Limits doubled for structure searching in CAS REGISTRY
NEWS	10	MAY 08	STN Express, Version 8.4, now available
NEWS	11	MAY 11	STN on the Web enhanced
NEWS	12	MAY 11	BEILSTEIN substance information now available on STN Easy
NEWS	13	MAY 14	DGENE, PCTGEN and USGENE enhanced with increased limits for exact sequence match searches and introduction of free HIT display format
NEWS	14	MAY 15	INPADOCDB and INPAFAMDB enhanced with Chinese legal status data
NEWS	15	MAY 28	CAS databases on STN enhanced with NANO super role in records back to 1992
NEWS	16	JUN 01	CAS REGISTRY Source of Registration (SR) searching enhanced on STN

NEWS EXPRESS MAY 26 09 CURRENT WINDOWS VERSION IS V8.4,
AND CURRENT DISCOVER FILE IS DATED 06 APRIL 2009.

NEWS HOURS STN Operating Hours Plus Help Desk Availability
NEWS LOGIN Welcome Banner and News Items

Enter NEWS followed by the item number or name to see news on that specific topic.

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<12/04/2007> Erich Leese

and other penalties.

* * * * * * * * * * * * * * * * STN Columbus * * * * * * * * * * * * * * * *

FILE 'HOME' ENTERED AT 16:06:12 ON 09 JUN 2009

=> file reg

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.22	0.22

FILE 'REGISTRY' ENTERED AT 16:06:33 ON 09 JUN 2009
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 8 JUN 2009 HIGHEST RN 1154048-98-2
DICTIONARY FILE UPDATES: 8 JUN 2009 HIGHEST RN 1154048-98-2

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH January 9, 2009.

Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

http://www.cas.org/support/stngen/stndoc/properties.html

=> file casreact

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.48	0.70

FILE 'CASREACT' ENTERED AT 16:06:38 ON 09 JUN 2009
USE IS SUBJECT TO THE TERMS OF YOUR CUSTOMER AGREEMENT

FILE CONTENT:1840 - 8 Jun 2009 VOL 150 ISS 24

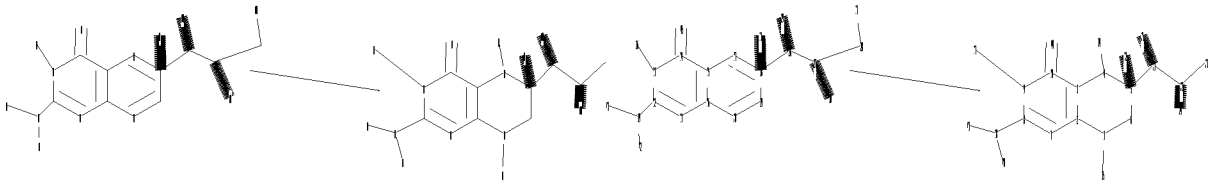
New CAS Information Use Policies, enter HELP USAGETERMS for details.

****
*
* CASREACT now has more than 16.5 million reactions *

*   *
****

This file contains CAS Registry Numbers for easy and accurate substance identification.

=>
Uploading C:\Program Files\Stnexp\Queries\10579106stereounspecific.str



chain nodes :
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
42 43 44 45
ring nodes :
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
chain bonds :
1-35 4-34 5-21 5-32 8-38 9-37 10-44 12-39 13-36 14-45 18-26 18-33 21-22
21-25 22-23 22-24 26-27 26-29 27-28 27-30 28-31 38-40 38-41 39-42 39-43

ring bonds :
1-2 1-6 2-3 2-7 3-4 3-10 4-5 5-6 7-8 8-9 9-10 11-12 11-16 12-13 13-14
14-15 15-16 15-17 16-20 17-18 18-19 19-20
exact/norm bonds :
1-2 1-6 2-3 2-7 3-4 3-10 4-5 5-6 7-8 8-9 8-38 9-10 10-44 11-12 11-16
12-13 12-39 13-14 14-15 14-45 21-25 22-24 26-29 27-30 28-31
exact bonds :
1-35 4-34 5-21 5-32 9-37 13-36 18-26 18-33 21-22 22-23 26-27 27-28
38-40 38-41 39-42 39-43
normalized bonds :
15-16 15-17 16-20 17-18 18-19 19-20
isolated ring systems :
containing 1 : 11 :

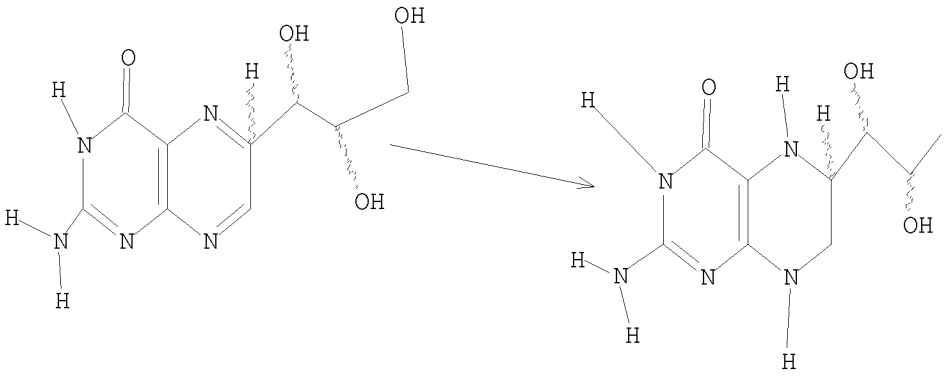
Match level :
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom
11:Atom 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:Atom
20:Atom 21:CLASS 22:CLASS 23:CLASS 24:CLASS 25:CLASS 26:CLASS 27:CLASS
28:CLASS 29:CLASS 30:CLASS 31:CLASS 32:CLASS 33:CLASS 34:CLASS 35:CLASS
36:CLASS 37:CLASS 38:CLASS 39:CLASS 40:CLASS 41:CLASS 42:CLASS 43:CLASS
44:CLASS 45:CLASS
fragments assigned product role:
containing 1

<12/04/2007> Erich Leese

fragments assigned reactant/reagent role:
containing 11

L1 STRUCTURE UPLOADED

=> d l1
L1 HAS NO ANSWERS
L1 STR



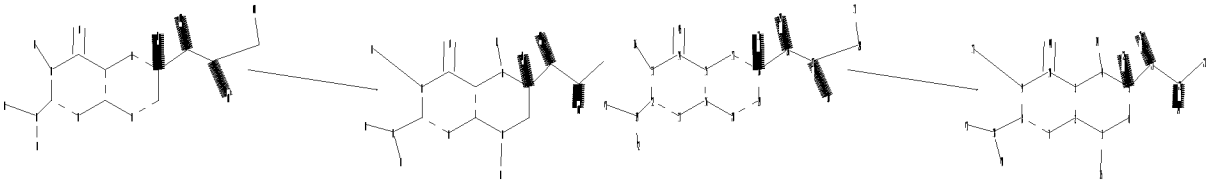
Structure attributes must be viewed using STN Express query preparation.

=> s l1 full
THE ESTIMATED SEARCH COST FOR FILE 'CASREACT' IS 122.65 U.S. DOLLARS
DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N or END:y
FULL SEARCH INITIATED 16:07:15 FILE 'CASREACT'
SCREENING COMPLETE - 29 REACTIONS TO VERIFY FROM 9 DOCUMENTS

100.0% DONE 29 VERIFIED 0 HIT RXNS 0 DOCS
SEARCH TIME: 00.00.01

L2 0 SEA SSS FUL L1 (0 REACTIONS)

=>
Uploading C:\Program Files\Stnexp\Queries\10579106unspecified bonds.str



chain nodes :
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
42 43 44 45
ring nodes :
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
chain bonds :

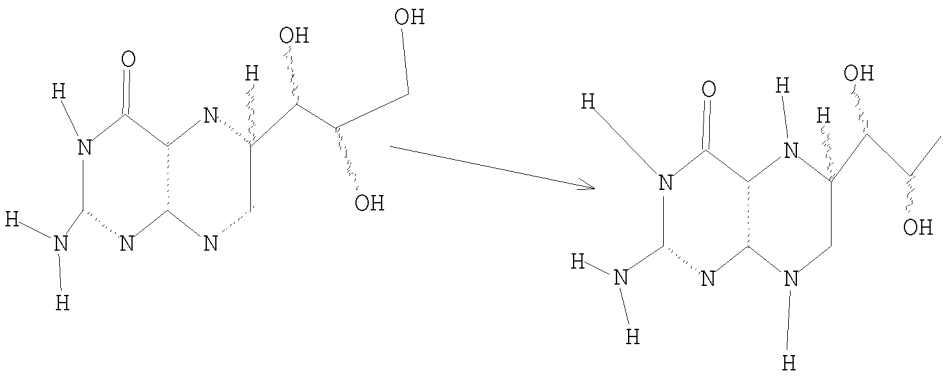
1-35 4-34 5-21 5-32 8-38 9-37 10-44 12-39 13-36 14-45 18-26 18-33 21-22
21-25 22-23 22-24 26-27 26-29 27-28 27-30 28-31 38-40 38-41 39-42 39-43

ring bonds :
1-2 1-6 2-3 2-7 3-4 3-10 4-5 5-6 7-8 8-9 9-10 11-12 11-16 12-13 13-14
14-15 15-16 15-17 16-20 17-18 18-19 19-20
exact/norm bonds :
1-2 1-6 2-3 2-7 3-4 3-10 4-5 5-6 7-8 8-9 8-38 9-10 10-44 11-12 11-16
12-13 12-39 13-14 14-15 14-45 15-16 15-17 16-20 17-18 18-19 19-20 21-25
22-24 26-29 27-30 28-31
exact bonds :
1-35 4-34 5-21 5-32 9-37 13-36 18-26 18-33 21-22 22-23 26-27 27-28
38-40 38-41 39-42 39-43
isolated ring systems :
containing 1 : 11 :

Match level :
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom
11:Atom 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:Atom
20:Atom 21:CLASS 22:CLASS 23:CLASS 24:CLASS 25:CLASS 26:CLASS 27:CLASS
28:CLASS 29:CLASS 30:CLASS 31:CLASS 32:CLASS 33:CLASS 34:CLASS 35:CLASS
36:CLASS 37:CLASS 38:CLASS 39:CLASS 40:CLASS 41:CLASS 42:CLASS 43:CLASS
44:CLASS 45:CLASS
fragments assigned product role:
containing 1
fragments assigned reactant/reagent role:
containing 11

L3 STRUCTURE UPLOADED

=> d l3
L3 HAS NO ANSWERS
L3 STR



Structure attributes must be viewed using STN Express query preparation.

=> s l3 full

THE ESTIMATED SEARCH COST FOR FILE 'CASREACT' IS 122.65 U.S. DOLLARS
DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N or END:y
FULL SEARCH INITIATED 16:08:50 FILE 'CASREACT'
SCREENING COMPLETE - 29 REACTIONS TO VERIFY FROM 9 DOCUMENTS

100.0% DONE 29 VERIFIED 0 HIT RXNS 0 DOCS
SEARCH TIME: 00.00.01

L4 0 SEA SSS FUL L3 (0 REACTIONS)

=> file reg

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	247.22	247.92

FILE 'REGISTRY' ENTERED AT 16:09:12 ON 09 JUN 2009
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

Property values tagged with IC are from the ZIC/VINITI data file
provided by InfoChem.

STRUCTURE FILE UPDATES: 8 JUN 2009 HIGHEST RN 1154048-98-2
DICTIONARY FILE UPDATES: 8 JUN 2009 HIGHEST RN 1154048-98-2

New CAS Information Use Policies, enter HELP USAGETERMS for details.

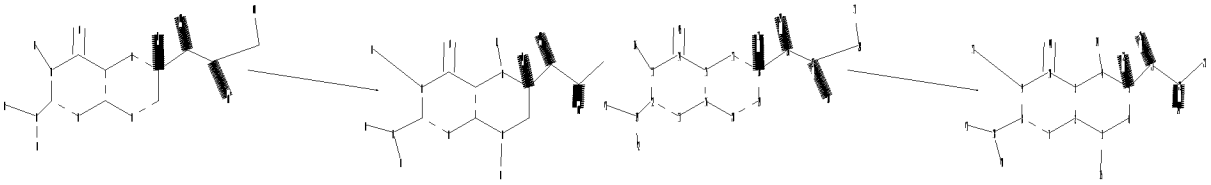
TSCA INFORMATION NOW CURRENT THROUGH January 9, 2009.

Please note that search-term pricing does apply when
conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and
predicted properties as well as tags indicating availability of
experimental property data in the original document. For information
on property searching in REGISTRY, refer to:

http://www.cas.org/support/stngen/stndoc/properties.html

=>
Uploading C:\Program Files\Stnexp\Queries\10579106unspecified bonds.str



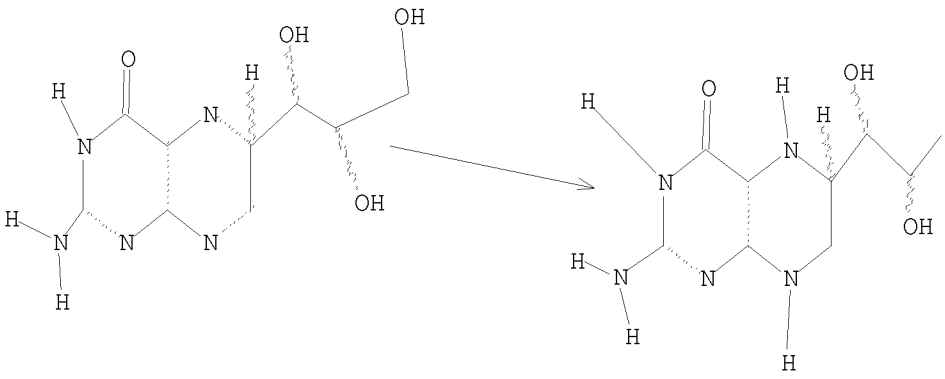
chain nodes :
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
42 43 44 45
ring nodes :
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
chain bonds :
1-35 4-34 5-21 5-32 8-38 9-37 10-44 12-39 13-36 14-45 18-26 18-33 21-22
21-25 22-23 22-24 26-27 26-29 27-28 27-30 28-31 38-40 38-41 39-42 39-43

ring bonds :
1-2 1-6 2-3 2-7 3-4 3-10 4-5 5-6 7-8 8-9 9-10 11-12 11-16 12-13 13-14
14-15 15-16 15-17 16-20 17-18 18-19 19-20
exact/norm bonds :
1-2 1-6 2-3 2-7 3-4 3-10 4-5 5-6 7-8 8-9 8-38 9-10 10-44 11-12 11-16
12-13 12-39 13-14 14-15 14-45 15-16 15-17 16-20 17-18 18-19 19-20 21-25
22-24 26-29 27-30 28-31
exact bonds :
1-35 4-34 5-21 5-32 9-37 13-36 18-26 18-33 21-22 22-23 26-27 27-28
38-40 38-41 39-42 39-43
isolated ring systems :
containing 1 : 11 :

Match level :
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom
11:Atom 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:Atom
20:Atom 21:CLASS 22:CLASS 23:CLASS 24:CLASS 25:CLASS 26:CLASS 27:CLASS
28:CLASS 29:CLASS 30:CLASS 31:CLASS 32:CLASS 33:CLASS 34:CLASS 35:CLASS
36:CLASS 37:CLASS 38:CLASS 39:CLASS 40:CLASS 41:CLASS 42:CLASS 43:CLASS
44:CLASS 45:CLASS
fragments assigned product role:
containing 1
fragments assigned reactant/reagent role:
containing 11

L5 STRUCTURE UPLOADED

=> d l5
L5 HAS NO ANSWERS
L5 STR



Structure attributes must be viewed using STN Express query preparation.

=> s l5 full
THE ESTIMATED SEARCH COST FOR FILE 'REGISTRY' IS 185.40 U.S. DOLLARS
DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N or END:y

MULTIPLE ROLE QUERIES ARE NOT ALLOWED IN A NON-REACTION FILE
COMMAND INTERRUPTED
If this message appears repeatedly, please notify the Help Desk.
Enter "HELP STN" for information on contacting the nearest STN Help Desk by telephone or via SEND in the STNMAIL file.

=> file casreact

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	2.40	250.32

FILE 'CASREACT' ENTERED AT 16:12:07 ON 09 JUN 2009

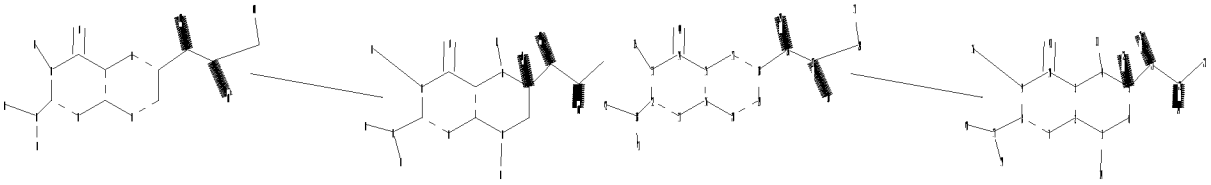
FILE CONTENT:1840 - 8 Jun 2009 VOL 150 ISS 24

New CAS Information Use Policies, enter HELP USAGETERMS for details.

****
*
* CASREACT now has more than 16.5 million reactions
*
****

This file contains CAS Registry Numbers for easy and accurate substance identification.

=>
Uploading C:\Program Files\Stnexp\Queries\10579106last.str



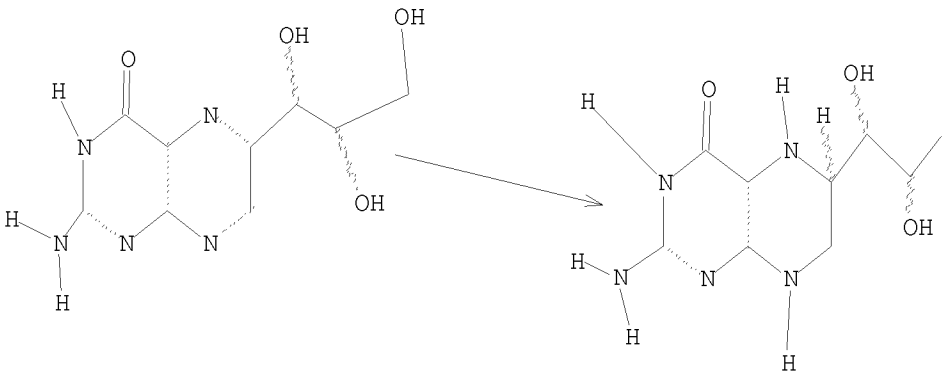
chain nodes :
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44
ring nodes :
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
chain bonds :

1-34 4-33 5-21 5-32 8-37 9-36 10-43 12-38 13-35 14-44 18-26 21-22 21-25
22-23 22-24 26-27 26-29 27-28 27-30 28-31 37-39 37-40 38-41 38-42
ring bonds :
1-2 1-6 2-3 2-7 3-4 3-10 4-5 5-6 7-8 8-9 9-10 11-12 11-16 12-13 13-14
14-15 15-16 15-17 16-20 17-18 18-19 19-20
exact/norm bonds :
1-2 1-6 2-3 2-7 3-4 3-10 4-5 5-6 7-8 8-9 8-37 9-10 10-43 11-12 11-16
12-13 12-38 13-14 14-15 14-44 15-16 15-17 16-20 17-18 18-19 19-20 21-25
22-24 26-29 27-30 28-31
exact bonds :
1-34 4-33 5-21 5-32 9-36 13-35 18-26 21-22 22-23 26-27 27-28 37-39
37-40 38-41 38-42
isolated ring systems :
containing 1 : 11 :

Match level :
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom
11:Atom 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:Atom
20:Atom 21:CLASS 22:CLASS 23:CLASS 24:CLASS 25:CLASS 26:CLASS 27:CLASS
28:CLASS 29:CLASS 30:CLASS 31:CLASS 32:CLASS 33:CLASS 34:CLASS 35:CLASS
36:CLASS 37:CLASS 38:CLASS 39:CLASS 40:CLASS 41:CLASS 42:CLASS 43:CLASS
44:CLASS
fragments assigned product role:
containing 1
fragments assigned reactant/reagent role:
containing 11

L6 STRUCTURE UPLOADED

=> d l6
L6 HAS NO ANSWERS
L6 STR



Structure attributes must be viewed using STN Express query preparation.

=> s l6 full
THE ESTIMATED SEARCH COST FOR FILE 'CASREACT' IS 122.65 U.S. DOLLARS

```
DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N or END:y
FULL SEARCH INITIATED 16:12:42 FILE 'CASREACT'
SCREENING COMPLETE -       29 REACTIONS TO VERIFY FROM        9 DOCUMENTS

100.0% DONE      29 VERIFIED       4 HIT RXNS                        3 DOCS
SEARCH TIME: 00.00.01

L7            3 SEA SSS FUL L6 (     4 REACTIONS)

=> d ibib abs hitstr tot
'HITSTR' IS NOT A VALID FORMAT FOR FILE 'CASREACT'

The following are valid formats:

ABS -------- GI and AB
ALL -------- BIB, AB, IND, RE, Single-step Reactions
APPS ------- AI, PRAI
BIB -------- AN, plus Bibliographic Data
CAN -------- List of CA abstract numbers without answer numbers
CBIB ------- AN, plus Compressed Bibliographic Data
DALL ------- ALL, delimited (end of each field identified)
IABS ------- ABS, indented with text labels
IALL ------- ALL, indented with text labels
IBIB ------- BIB, indented with text labels
IND -------- Indexing data
IPC -------- International Patent Classifications
ISTD ------- STD, indented with text labels
OBIB -------- AN, plus Bibliographic Data (original)
OIBIB ------- OBIB, indented with text labels

SBIB -------- BIB, no citations
SIBIB ------- IBIB, no citations

MAX -------- Same as ALL
PATS ------- PI, SO
SCAN ------- TI and FCRD (random display, no answer number.  SCAN
             must be entered on the same line as DISPLAY, e.g.,
             D SCAN.)
SSRX ------- Single-Step Reactions (Map, Diagram, and Summary for
             all single-step reactions)
STD -------- BIB, IPC, and NCL

CRD -------- Compact Display of All Hit Reactions
CRDREF ----- Compact Reaction Display and SO, PY for Reference
FHIT ------- Reaction Map, Diagram, and Summary for first
             hit reaction
FHITCBIB --- FHIT, AN plus CBIB
FCRD ------- First hit in Compact Reaction Display (CRD) format
FCRDREF ---- First hit in Compact Reaction Display (CRD) format with
             CA reference information (SO, PY).  (Default)
FPATH ------ PATH, plus Reaction Summary for the "long path"
FSPATH ----- SPATH, plus Reaction Summary for the "short path"
HIT -------- Reaction Map, Reaction Diagram, and Reaction
             Summary for all hit reactions and fields containing
             hit terms
OCC -------- All hit fields and the number of occurrences of the
             hit terms in each field.  Includes total number of
```

HIT, PATH, SPATH reactions. Labels reactions that have incomplete verifications.

PATH ------- Reaction Map and Reaction Diagram for the "long path". Displays all hit reactions, except those whose steps are totally included within another hit reaction which is displayed

RX --------- Hit Reactions (Map, Diagram, Summary for all hit reactions)

RXG -------- Hit Reaction Graphics (Map and Diagram for all hit reactions)

RXL -------- Hit Reaction Long (Map, Diagram, Summary for all hit reactions)

RXS -------- Hit Reaction Summariers (Map and Summary for all hit reactions)

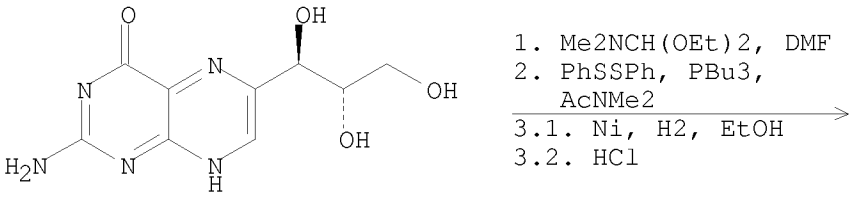
SPATH ------ Reaction Map and Reaction Diagram for the "short path". Displays all single step reactions which contain a hit substance. Also displays those multistep reactions that have a hit substance in both the first and last steps of the reaction, except for those hit reactions whose steps are totally included within another hit reaction which is displayed

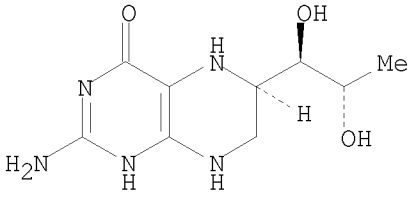
To display a particular field or fields, enter the display field codes. For a list of the display field codes, enter HELP DFIELDS at an arrow prompt (=>). Examples of combinations include: D TI; D BIB RX; D TI, AU, FCRD. The information is displayed in the same order as the specification. All of the formats, except CRD, CRDREF, FHIT, PATH, FPATH, SPATH, FSPATH, FCRD, FCRDREF, HIT, RX, RXG, RXS, SCAN, and OCC, may be used with the DISPLAY command to display the record for a specified Accession Number.

ENTER DISPLAY FORMAT (FCRDREF):.
THE ESTIMATED COST FOR THIS REQUEST IS 9.18 U.S. DOLLARS
DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N:y

L7 ANSWER 1 OF 3 CASREACT COPYRIGHT 2009 ACS on STN

RX(13) OF 15 - 3 STEPS





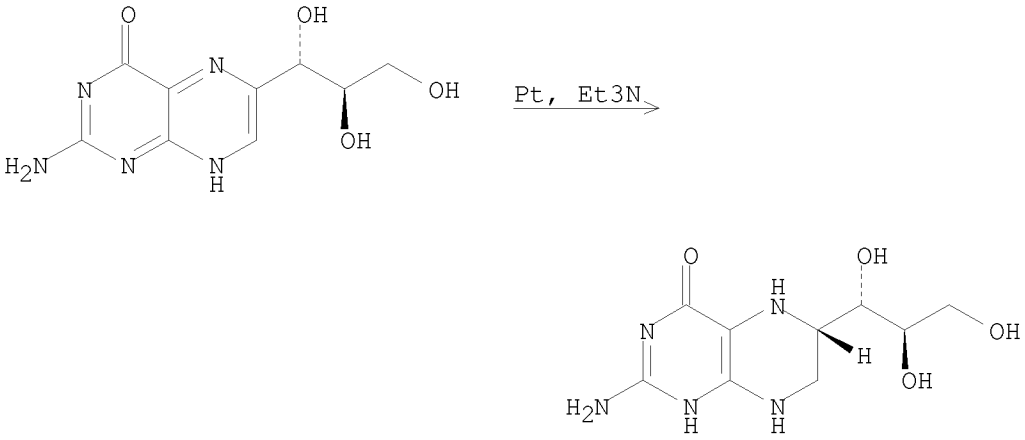
stereoisomers

16%

REF: PCT Int. Appl., 2005049614, 02 Jun 2005
NOTE: 3) stereoselective, Raney nickel was used
CON: STEP(1) 6 hours, room temperature
STEP(2.1) room temperature; 4 hours, room temperature
STEP(3.1) room temperature; 17 hours, room temperature, 5 bar

L7 ANSWER 2 OF 3 CASREACT COPYRIGHT 2009 ACS on STN

RX(1) OF 1

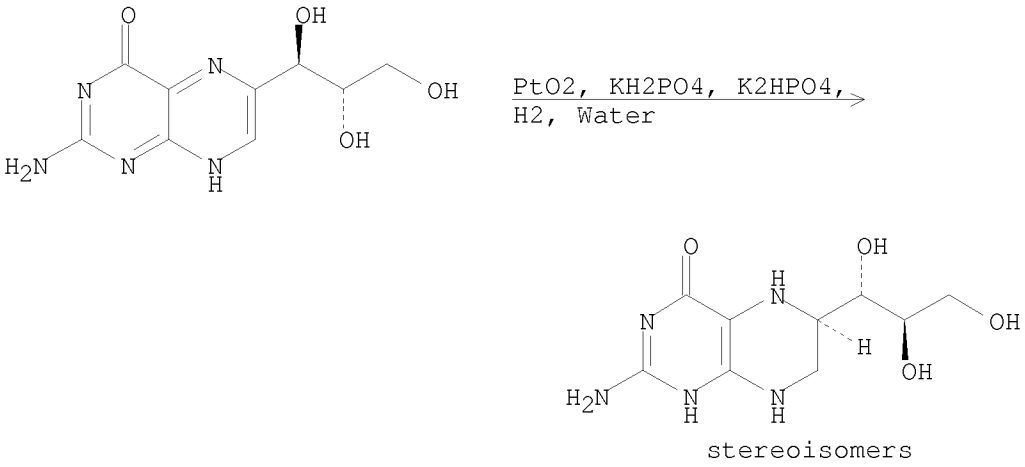


2 HCl

REF: Jpn. Kokai Tokkyo Koho, 07188233, 25 Jul 1995, Heisei
NOTE: at 0-5.degree., 100 Kg/cm2 for 20 min

L7 ANSWER 3 OF 3 CASREACT COPYRIGHT 2009 ACS on STN

RX(6) OF 7



stereoisomers

REF: Heterocycles, 23(12), 3115-20; 1985
NOTE: pH .gtoreq.10.8

```
=> s l7 full
THE ESTIMATED SEARCH COST FOR FILE 'CASREACT' IS 122.65 U.S. DOLLARS
DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N or END:y
FULL SEARCH INITIATED 16:13:45 FILE 'CASREACT'
SCREENING COMPLETE -       29 REACTIONS TO VERIFY FROM        9 DOCUMENTS

100.0% DONE      29 VERIFIED       4 HIT RXNS                       3 DOCS
SEARCH TIME: 00.00.01

L8            3 SEA SSS FUL L6 (     4 REACTIONS)

=> d ibib abs fhit tot
THE ESTIMATED COST FOR THIS REQUEST IS 15.63 U.S. DOLLARS
DO YOU WANT TO CONTINUE WITH THIS REQUEST? (Y)/N:y
```

L8 ANSWER 1 OF 3 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 143:7534 CASREACT
TITLE: Preparation of tetrahydrobiopterin and analogs of tetrahydrobiopterin
INVENTOR(S): Moser, Rudolf; Groehn, Viola; Schumacher, Andreas; Martin, Pierre
PATENT ASSIGNEE(S): Biomarin Pharmaceutical Inc., USA; Merck Eprova A.-G.
SOURCE: PCT Int. Appl., 55 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005049614	A2	20050602	WO 2004-US38313	20041117
WO 2005049614	A3	20070308		
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AU 2004290692	A1	20050602	AU 2004-290692	20041117
CA 2545484	A1	20050602	CA 2004-2545484	20041117
EP 1776364	A2	20070425	EP 2004-819154	20041117
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JP 2007534637	T	20071129	JP 2006-539994	20041117
US 20070244322	A1	20071018	US 2007-579106	20070216
PRIORITY APPLN. INFO.:			US 2003-520367P	20031117
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			WO 2004-US38313	20041117

OTHER SOURCE(S): MARPAT 143:7534
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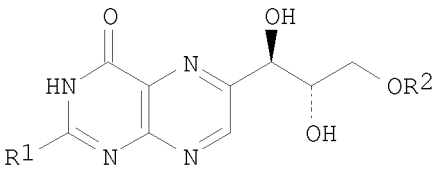

I

AB A process for the preparation of tetrahydrobiopterin and its analogs, e.g. I [R1 = alkylamino, arylamino, alkylthio, alkylaminomethyleneimino, R2 = H; R1 = alkylamino, alkylthio, Me2NCH:N, R2 = Me2CHEt2Si, (Me3CO)Ph2Si, MePh2Si, Me3CMe2Si, Me3C(MeO)PhSi, (Me3C)2MeSi, etc.], from neopterin

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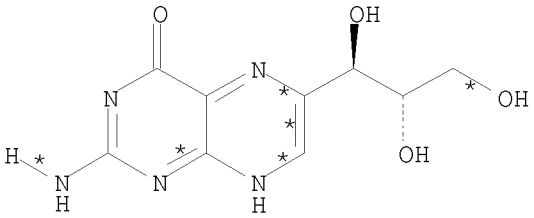
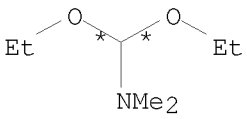
and/or 6-substituted pterins with an improved yield and a high stereoselectivity is disclosed. Also disclosed herein are novel individual intermediates prepared in the preparation of tetrahydrobiopterin, such as selectively protected neopterin useful for the preparation of tetrahydrobiopterin. As an example, L-neopterin was reacted with DMF-acetal to give the 2-(dimethylamino)methylene derivative I (R1 = Me2NCH:N, R2 = H) (II). II was then silylated to I (R2 = Me3CPh2Si) which could be deprotected to I (R1 = NH2).

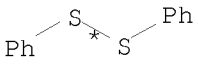
RX(13) OF 15 COMPOSED OF RX(1), RX(5), RX(6)
RX(13) 2 A + 2 B + 2 N ===> R + S



2 A

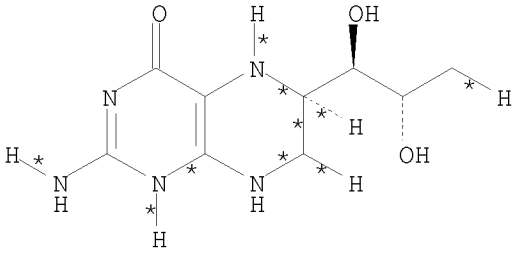


2 B

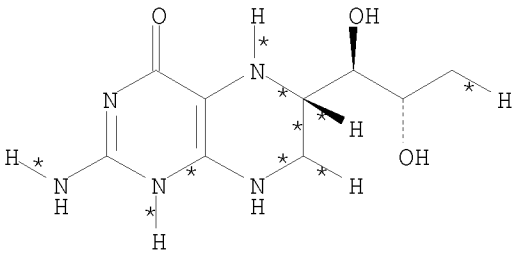


2 N

3 STEPS



R
YIELD 16%



S
YIELD 9%

```
RX(1)     RCT  A 2277-43-2, B 1188-33-6
          PRO  C 852547-43-4
          SOL  68-12-2 DMF
          CON  6 hours, room temperature

RX(5)     RCT  C 852547-43-4, N 882-33-7
          RGT  P 998-40-3 PBu3
          PRO  O 852547-49-0
          SOL  127-19-5 AcNMe2
          CON  SUBSTAGE(1) room temperature
               SUBSTAGE(2) 4 hours, room temperature

RX(6)     RCT  O 852547-49-0

            STAGE(1)
               RGT  T 1333-74-0 H2
               CAT  7440-02-0 Ni
               SOL  64-17-5 EtOH
               CON  SUBSTAGE(1) room temperature
                    SUBSTAGE(2) 17 hours, room temperature, 5 bar

            STAGE(2)
               RGT  U 7647-01-0 HCl

          PRO  R 62989-33-7, S 62961-57-3
          NTE  stereoselective, Raney nickel was used
```

L8 ANSWER 2 OF 3 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 123:256436 CASREACT
TITLE: Preparation of (6S)-tetrahydro-D-neopterin via catalytic hydrogenation of D-neopterin.
INVENTOR(S): Mochizuki, Naoki; Uemitsu, Nobuo
PATENT ASSIGNEE(S): Asahi Breweries Ltd, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 07188233	A	19950725	JP 1993-346845	19931227
JP 2995448	B2	19991227		

PRIORITY APPLN. INFO.: JP 1993-346845 19931227
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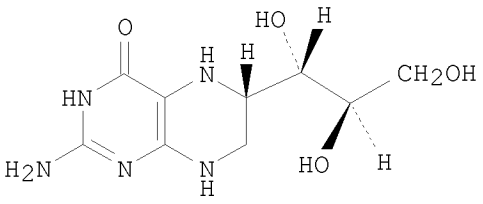
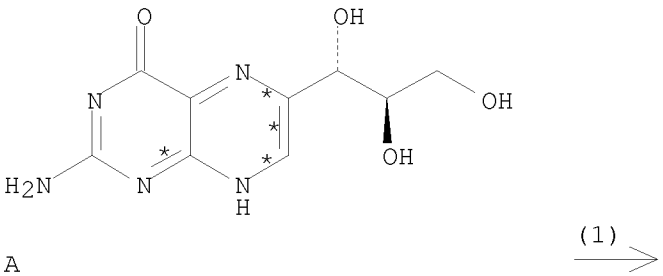


I

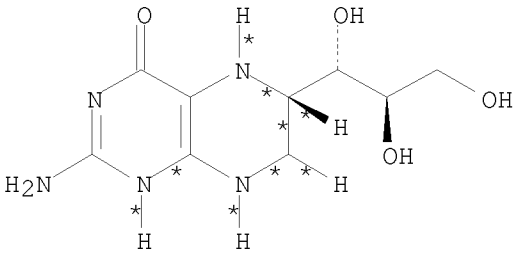
AB (6S)-tetrahydro-D-neopterin (I) is prepared via hydrogenation of D-neopterin under 80-120 Kg/cm2 pressure, pH 10-13. Thus, D-neopterin, platinum, and Et3N were placed in an autoclave and the reaction mixture was maintained at 0-5°, 100 Kg/cm2 for 20 min to give, after treatment with concentrated HCl, I dihydrochloride.

RX(1) OF 1 A ===> B



A

(1)



● 2 HCl

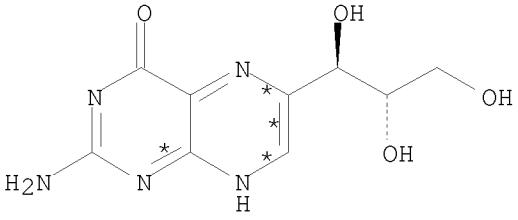
B

RX(1) RCT A 2009-64-5
RGT C 121-44-8 Et3N
PRO B 169219-49-2
CAT 7440-06-4 Pt
NTE at 0-5°, 100 Kg/cm2 for 20 min

L8 ANSWER 3 OF 3 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 105:208658 CASREACT
TITLE: Hydrogenation of biopterin and its analogs; application for the convenient procedure of biopterin cofactor and related 5,6,7,8-tetrahydropterins
AUTHOR(S): Matsuura, Sadao; Murata, Shizuaki; Sugimoto, Takashi
CORPORATE SOURCE: Coll. Gen. Educ., Nagoya Univ., Nagoya, 464, Japan
SOURCE: Heterocycles (1985), 23(12), 3115-20
CODEN: HTCYAM; ISSN: 0385-5414
DOCUMENT TYPE: Journal
LANGUAGE: English

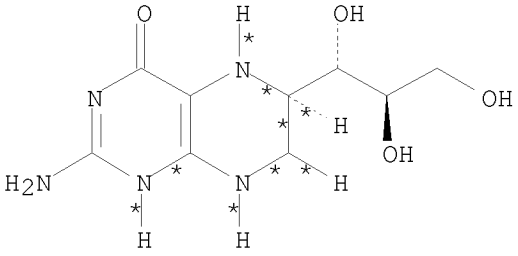
AB A large scale and stereoselective hydrogenation of biopterin to (6R)-5,6,7,8-tetrahydrobiopterin was achieved by using PtO2 catalyst at pH 11.8. The procedure was applied for various hydroxyalkylpterins such as neopterin and diastereomers of biopterin.

RX(6) OF 7 2 S ===> T + U

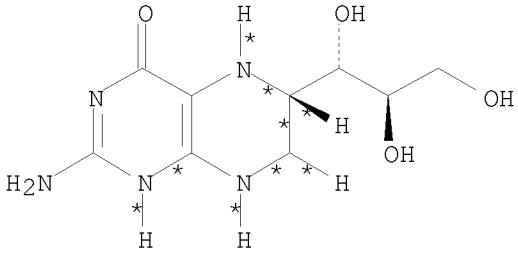


2 S

(6)



T



U

RX(6) RCT S 2277-43-2
RGT D 7778-77-0 KH2PO4, E 7758-11-4 K2HPO4, F 1333-74-0 H2
PRO T 78737-51-6, U 78737-52-7
CAT 1314-15-4 PtO2
SOL 7732-18-5 Water
NTE pH ≥10.8

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=> d his

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L3             STRUCTURE UPLOADED
L4           0 S L3 FULL

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L5             STRUCTURE UPLOADED

     FILE 'CASREACT' ENTERED AT 16:12:07 ON 09 JUN 2009
L6             STRUCTURE UPLOADED
L7           3 S L6 FULL
L8           3 S L7 FULL

=> log y
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FULL ESTIMATED COST                              272.51     522.83

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)      SINCE FILE      TOTAL
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CA SUBSCRIBER PRICE                               -2.34      -2.34

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